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Working Paper

The economics of politically-connected firms

Dresden discussion paper series in economics, No. 07/08

Provided in cooperation with:
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TECHNISCHE UNIVERSITÄT DRESDEN

TU Dresden
Faculty of Business and Economics

Dresden Discussion Paper Series in Economics

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ISSN 0945-4829

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Internet:

An electronic version of the paper may be downloaded from the homepage:
http://rcswww.urz.tu-dresden.de/wpeconomics/index.htm

English papers are also available from the SSRN website:
http://www.ssrn.com

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The Economics of Politically-Connected Firms

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Abstract:

Political connections between firms and autocratic regimes are not secret and often even publicly displayed in many developing economies. We argue that tying a firm's available rent to a regime's survival acts as a credible commitment forcing entrepreneurs to support the government and to exert effort in its stabilization. In return, politically-connected firms get access to profitable markets and are exempted from the regime's extortion. We show that such a gift exchange between government and politically-connected firms can only exist if certain institutional conditions are met. In particular, the stability of the regime has to be sufficiently low and the regime needs the power to exploit independent firms. We also show that building up a network of politically-connected firms acts as a substitute for investments in autonomous stability (such as spending on military and police force). The indirect strategy of stabilizing a regime via politically-connected firms gradually becomes inferior when a regime's exploitative power rises.

JEL-Classification: H1, H26, H32, L1

Keywords: Politically-Connected Firms, Clientelism, Political Stability

1. Introduction

There is a large amount of anecdotal evidence that political connections play an important role for business people as well as for politicians. Politicians grant special rights, award import licenses, and restrict entry into markets to the benefit of entrepreneurs who are known to be close political allies. In dictatorial regimes, huge industrial conglomerates are controlled by family members and close friends of the ruling elite. Indonesia's long-time dictator Suharto helped his six children and close political allies to build very profitable business empires. When Suharto had to step down in May 1998, the fortune of his family was estimated at $15 billion. Liem Sioe Liong, one of the closest allies of Suharto in the business community, became one of the richest billionaires in Southeast Asia (Colmey and Liebhold 1999, King 2000). This episode shows that the benefits of political connections do accrue not only to members of the ruling families (nepotism) but also to affiliated entrepreneurs who are not directly related to the government.

Such close connections between businesses and the political sphere are documented almost daily in newspapers and magazines. These reports predominantly concern notoriously corrupt regimes in developing countries, but clientelism is also an issue in the highly industrialized economies in Europe and North America.[1] Surprisingly the economic profession has paid little attention to this phenomenon until very recently. In the last few years, however, at least some papers have asked questions related to several aspects of politically-connected firms. There are at least five important questions that have been or should be dealt with. Firstly, to what extent do firms benefit from their policy connections? Secondly, why do firms employ former politicians? Thirdly, how do politicians benefit from politically-connected firms? Fourth, what institutional arrangements favour the emergence

[1] A quite common phenomenon with politically-connected firm is the appointment of political allies for top positions in state-owned firms.

and survival of clientelism? And finally, are politically-connected firms a boon or a burden from a welfare perspective?

The first question – how firms benefit from political connections – has received the most attention in the literature so far. The seminal paper in this area was written by Brian E. Roberts (1990). He analysed the unexpected death of Senator Henry Jackson, who was the chairman of the influential Senate Armed Services Committee. The "natural experiment" allowed estimating the value of political connections. The share prices of firms with ties to Senator Jackson dropped whereas the share prices of firms connected to his (designated) successor, Sam Nunn, gained. The effects were significant though small in absolute terms.[2]

Raymond Fisman (2001) estimates the value of political connections in Indonesia during the last years of the Suharto regime where political ties were certainly more important than in the US. To evaluate political connections, Fisman analysed the impact of rumours about Suharto's health on the returns of firms with differing degrees of political connections to the regime. He found that political connections determined to a large extent the value of firms, rather than fundamentals such as productivity.

Johnson and Mitton (2003) show that politically-connected firms benefited from the capital controls imposed in Malaysia during the Asian financial crisis in 1998. After the imposition of capital controls, firms with political connections to Prime Minister Mahathir Mohamad had significantly higher stock returns. Khwaja and Mian (2005) demonstrate that politically-connected firms receive preferential treatment in Pakistan's credit market. They receive larger loans from government banks despite exhibiting higher default rates.[3]

Secondly, why do firms employ former politicians? Unfortunately, hard evidence on this question is scarce, in particular for developing economies. Beyond anecdotal evidence,

[2] Faccio and Parsley (2007) extend the analysis to a large international dataset containing sudden deaths of politicians since 1973. Firm values drop by 1.7% in the wake of an affiliated politician's death.

[3] Ferguson and Voth (2005) apply the concept of politically-connected firms to German economic history and document that firms with close ties to the NSDAP outperformed the market after Hitler's "seizure of power" in 1933.

Agrawal and Knoeber (2001) have undertaken a comprehensive study of the appointment of politically experienced managers in US manufacturing firms. One of their central findings is that politically experienced managers are more prevalent when exports, lobbying and sales to the public sector play an important role. Goldman, Rocholl and So (2006) find that the announcement of nominations of former politicians to the company board results in positive abnormal stock returns even among S&P500 companies. Faccio (2006) uses a rich international data set on politically-connected firms and shows that politicians joining company boards do not increase corporate value whereas board members entering politics significantly enhance the corporate value.

The latter issue bring us to a third point: Why do politicians grant benefits to politically-connected firms? Most papers take the view of firms and ask how firms benefit from political connections. The other side of the "market" has been largely ignored in the research agenda so far. How can politicians benefit from politically-connected firms? How do political institutions affect the emergence of clientelism? What kind of inefficiencies evolve from political connections?

The only papers until now that deal with these issues are by Kurer (1993) and by Robinson and Verdier (2001). Kurer (1993) argues that corruption is more detrimental in clientelist systems as licenses and other benefits are awarded to politically-connected firms. These firms, however, are not necessarily the most efficient producers. Robinson and Verdier (2001) analyse income redistribution via employment in the public sector. Politicians hand out jobs in the bureaucracy to their followers. As these positions generate rents, the job holders have an interest to support the politicians in elections. If the politician loses power, his clients will lose their jobs. The authors stress the political exchange of jobs against support which comes through voting. This exchange requires close social networks where the behaviour of the clientele can be observed relatively well. In this model, inefficiencies arise since employment in the public sector is an inefficient way of redistribution.

The model by Robinson and Verdier may explain why some of the benefits are distributed towards the decisive clientele that is almost indifferent in whether to vote for the incumbent politician or his challenger. However, it cannot explain why the largest share of benefits is given to those groups that will support the incumbent politician anyway.

This is the point of departure for our paper. We view cronyism as a credible gift exchange between politicians and favoured firms. The politician grants special rights (via import licenses, entry regulation ...) to politically-connected entrepreneurs or exempts politically-connected firms from government interventions (taxes, costly regulations …), boosting profits. The entrepreneurs in turn have an incentive to invest in stabilizing the regime because, in case of a changeover of power, the firm will lose the politically granted benefits. For instance, two major business tycoons in Indonesia, Liem Sioe Liong and Mohammad Hasan, were known to be major contributors to Suharto foundations (*yayasan*), which were officially set up as charities but were also used to finance political operations stabilizing the Suharto regime (King 2000). As political ties are public knowledge, new political leaders will simply take away the special rights of previously favoured firms or the assets of entrepreneur might even be expropriated. This was, for instance, the case in Indonesia where Suharto seized two industrial conglomerates controlled by his predecessor Sukarno. The firms were handed over to a close political ally of Suharto, former general Achmad Tirtosudiro (Colmey and Liebhold 1999).

The gift exchange between politician and favoured firms generates a public-good dilemma. Individual effort of an entrepreneur in stabilizing the current regime benefits all politically-connected firms equally. The higher the total effort of all entrepreneurs the larger is the probability for the current regime to maintain its power. As the politician cannot contract the optimal effort for political support directly, the only instrument to control political support is via the number of politically-connected firms. As more entrepreneurs are tied to the ruling political elite, the provision of the public good “stability of the regime” will

rise. Increasing the number of politically-connected firms, however, comes at a cost. First, more entrepreneurial resources are diverted from rent creation, i.e. managing the firm, to efforts towards stabilizing the regime. Secondly, the politician has to leave more rents to the connected firms and cannot appropriate the entrepreneurial rents for himself.

We show that a regime may face a critical-mass problem in setting up a system of politically-connected firms. With a small number of politically-connected firms, the stability of the regime is low and each entrepreneur may prefer to run a politically independent firm. The larger the number of political allies, the more attractive becomes the membership in a network of politically-connected firms. This threshold phenomenon gives rise to some interesting and testable properties of equilibria with politically-connected firms. We demonstrate that clientelism can only emerge under specific institutional parameters. Firstly, a regime has to have sufficient exploitative power to make it less attractive for entrepreneurs to run their firms independently from the political sphere. Secondly, the stability of the regime has to be sufficiently low so that a regime is forced to share its rents with political allies in the industrial sector.

Section 2 develops a simple model of politically-connected firms stabilizing a regime. In Section 3, we derive the comparative-static results of the model and show which institutional arrangements are crucial for the existence of politically-connected firms. Section 4 extends the model by endogenizing the government's investment in military strength and stability. In Section 5, we discuss how the model can be used to analyse the role of politically-connected firms in (partly) democratic societies. Section 6 concludes.

2. A Simple Model of Politically-Connected Firms

We develop a simple model of an authoritarian regime which cannot be contested in elections and which maximizes its revenue resources by granting import licenses. For each import good, the government grants an important license to an entrepreneur. Overall, there are N

separate markets for import goods and *N* firms holding import licenses. Each import license generates a profit of θ. How much of this profit is appropriated by the firm depends on the firm's status towards the regime. Politically-connected firms receive the full share of profits in exchange for their political support. A politically independent firm is taxed at the rate τ, i.e. the entrepreneur earns $(1-\tau)\cdot\theta$. The rate τ contains all types of rent extraction by the political regime (bribes, donations …).[4] Hence, τ is treated as a measure of the regime's exploitative power. The rent extraction may be limited by the feasible outside options for politically independent firms. The easier it is for firms to hide profits, to escape into the shadow economy or to circumvent import restrictions through smuggling, the more limited will be the government's exploitative power and the lower has to be its tax rate τ.[5]

The stability of the government is measured by the survival probability *p* of the regime. The survival probability is determined by two factors: first by the autonomous stability of the regime and secondly by the stabilizing efforts of the politically-connected firms. The autonomous stability π may depend, for instance, on the military strength of the regime. In the basic model, we treat the autonomous stability as exogenous. The stabilizing effort of the politically-connected firms is given by $\sum_{i=1}^{n} g_i$ where g_i is the entrepreneur *i*'s effort in supporting the regime and *n* is the number of politically-connected firms. For simplicity, we assume a quadratic cost function. Politically-connected entrepreneurs use time and effort, e.g., in campaigning for the current regime, in convincing the public of the favourable economic conditions in the country and in organizing their employees as supporters of the government.

[4] Using the World Business Environment Survey of the World Bank, Chong and Gradstein (2007) demonstrate that politically influential firms perceive government institutions as helpful whereas politically independent firms feel impeded. Faccio (2006) shows that politically-connected firms are more prevalent in corrupt economies and in countries that regulate foreign investments by their residents. For a formal analysis of corruption and the consequences on economic activity, see, e.g., Shleifer and Vishny (1993) or Choi and Thum (2003, 2004).

[5] All firms are assumed to be identical as we want to focus on the institutional conditions preparing the grounds for politically-connected firms. In Choi and Thum (2008), we allow for heterogeneous firms and analyse which type of entrepreneurs join such a network.

We define the total survival probability of the regime as $p \equiv \pi + z \cdot \sum_{i=1}^{n} g_i$ where z is a measure for the effectiveness of political support.[6] Throughout the paper, we will assume $p \in (0,1)$. With probability $1-p$, the regime is overthrown and the ruling elite loses all its privileges. For simplicity, we assume that the current regime is followed by a 'clean' government. The current regime and its political allies are expropriated, the previously independent firms are no longer scrutinized by rent extraction.[7]

The government maximizes expected revenues $R = p(\pi, g^*, n) \cdot (N-n) \cdot \tau \cdot \theta$. The regime survives with probability p which depends on the autonomous stability, the equilibrium stabilization efforts g* and on the number of politically-connected firms. In case of survival, the government receives a revenue of $\tau \cdot \theta$ from each of the $(N-n)$ firms without political connections. The politically-connected firms independently choose their effort levels g_j to maximize the expected profit $Ey_j = p(\pi, g_j, g_{-j}, n) \cdot \theta - 1/2 \cdot g_j^2$. On the one hand, the effort g_j spent on stabilizing the regime diverts some of the entrepreneur's resources away from managing the firm and thus leads to a lower level of profits. On the other hand, the effort increases the stability of the regime. As this benefits equally all politically-connected firms and the ruling elite, creating stability is a typical public good. For simplicity, we normalize the payoff to zero in case of a turnover of the regime. This assumption implies that politically-connected entrepreneurs will be expropriated as punishment in case of a political turnover.

The timing of the game is as follows. First, the government chooses the number of politically-connected firms *n*. As the political ties of the *n* firms become public knowledge,

[6] See Grossman and Noh (1994) for a related model where the government's survival probability is endogenously determined. The risk of loosing power limits the incumbent regime's equilibrium tax rate and increases the spending on productive public goods.

[7] The qualitative results of our model do not depend on the assumption of a clean government following the current regime. The assumption just simplifies the formal analysis.

each firm's fate is now tied to the survival of the regime. Therefore, politically-connected firms have an incentive to support the regime and decide independently on their stabilization efforts in the second stage. As usual, we solve the game by using backward induction.

The Stabilizing Effort of Politically-Connected Firms

A politically-connected entrepreneur takes the number of politically-connected firms and the stabilization effort of other firms as given. The entrepreneur *j* maximizes his expected profit

$$\max_{g_j} \; Ey_j = \left(\pi + z \cdot \sum_{i=1}^{n} g_i \right) \cdot \theta - ½ \cdot g_j^{\,2} \tag{1}$$

by choosing the individual stabilization effort g_j. The privately optimal effort is

$$\frac{\partial Ey_j}{\partial g_j} = 0 \quad \Leftrightarrow \quad g_j^{*} = z \cdot \theta . \tag{2}$$

As all firms are identical, the survival probability of the regime amounts to $p^{*} = \pi + n \cdot z^2 \cdot \theta$. In equilibrium, the expected profit of politically-connected firms can be written as

$$Ey_j^{*} = \pi \cdot \theta + \left(n - ½\right) \cdot z^2 \cdot \theta^2 . \tag{3}$$

The expected payoff increases in the autonomous stability π, in the number (n) and effectiveness (z) of politically-connected firms, and in the size of economic rents θ.

The Regime's Choice of Politically-Connected Firms

The regime takes into account the stabilizing effort of politically-connected firms. In stage 1, the regime maximizes its expected revenues

$$\max_{n} \quad R = \left(\pi + n \cdot z^2 \cdot \theta\right) \cdot (N - n) \cdot \tau \cdot \theta$$

by choosing the optimal number of its political allies *n*:

$$\frac{\partial R}{\partial n} = \tau \cdot \theta \cdot \left[- \pi + \left(N - 2 \cdot n\right) \cdot z^2 \cdot \theta \right] = 0 \quad \Leftrightarrow \quad n^{*} = ½ \cdot \left(\mathrm{N} - \frac{\pi}{\mathrm{z}^2 \cdot \theta} \right). \tag{4}$$

Equation (4) immediately yields

Proposition 1. *The network of politically-connected firms increases with the efficiency of the political support (z) and with economic rents (θ). A network of politically-connected firms is a substitute for autonomous stability (π), i.e., the number of politically-connected firms decreases with autonomous stability.*

Note that political connections will only exist if the autonomous stability is sufficiently low: $\pi < \pi_1 \equiv N \cdot z^2 \cdot \theta$. So far, we have simply assumed that entrepreneurs find it profitable to participate in network of political allies. In the next section, we turn to the conditions under which such a network is profitable.

3. A Critical Mass of Politically-Connected Firms

Is it attractive for entrepreneurs to join a network of politically-connected firms? Or is it more profitable to maintain an independent stance despite the extortion by the regime? The answer to these questions may depend on whether the political network reaches a critical mass. A politically-connected firm earns expected profits of $Ey^* = \pi \cdot \theta + (n - ½) \cdot z^2 \cdot \theta^2$; an independent firm receives $p \cdot (1-\tau) \cdot \theta + (1-p) \cdot \theta$. Firms will have an incentive to join the network of political supporters if $Ey^* \geq p \cdot (1-\tau) \cdot \theta + (1-p) \cdot \theta$. Solving the inequality for n yields

$$n \geq \left[\frac{1 + ½ \cdot z^2 \cdot \theta}{1-\tau} - \pi \right] \cdot \frac{1}{z^2 \cdot \theta} \equiv \bar{n}. \qquad (5)$$

Hence, the regime may face a critical-mass problem. It has to create a network of at least $\bar{n}$ politically-connected firms to make joining worthwhile for firms.[8]

[8] The decision to join the network of politically-connected firms thus is characterized by positive externalities. The nature of positive spillovers in our model is similar to that of adoption externalities in the presence of network effects. See, for instance, Katz and Shapiro (1986) and Choi and Thum (1998) for an analysis of technology adoption with network effects.

Binding Participation Constraints for Politically-Connected Firms

Figure 1 illustrates the outcome. The horizontal axis measures the autonomous stability π, the vertical axis shows the number of politically-connected firms *n*. In the figure, n^* is the revenue maximizing number of firms, $\bar{n}$ is the smallest coalition of firms so that political support is profitable for entrepreneurs. Note that the n^*-curve is flatter than the $\bar{n}$-curve [see Eq. (4) and (5)]. For

$$\tau \leq \left(\frac{1}{z^2 \cdot \theta} - N + ½ \right) \cdot \frac{1}{N} \equiv \tau_0, \tag{6}$$

the threshold is always binding, i.e. the $\bar{n}$-curve is strictly above the n^*-curve. For

$$\tau \geq \left(\frac{1}{½ \cdot z^2 \cdot \theta} - N + 1 \right) \cdot \frac{1}{N} \equiv \tau_1,$$

the threshold is never binding. We focus on the intermediate case $\tau_0 < \tau < \tau_1$ as depicted in Figure 1.

If the autonomous stability of a regime is low $\left(0 \leq \pi < \pi_0 \equiv \frac{2 + z^2 \cdot \theta}{1 + \tau} - N \cdot z^2 \cdot \theta \right)$, the threshold is binding and the regime can only attract political supporters when it creates a large network of $\bar{n}$-firms. For intermediate values of the autonomous stability [$\pi_0 \leq \pi < \pi_1$], the regime can choose the profit maximizing number of politically-connected firms. Regimes with high autonomous stability [$\pi \geq \pi_1$] do not need support from politically-connected firms.

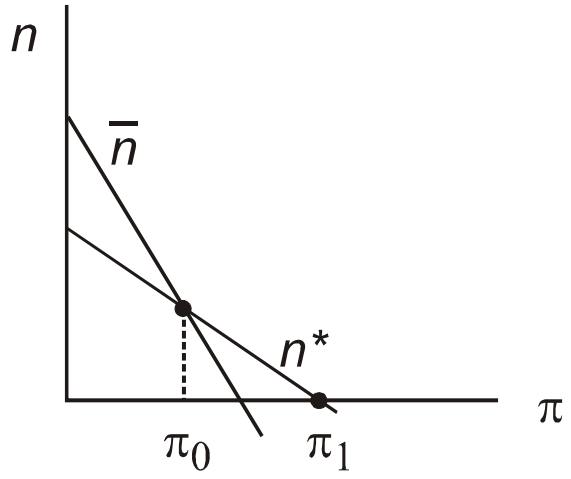

Figure 1. Critical mass and revenue maximizing coalition of politically-connected firms

Revenues With and Without a Critical Mass of Supporters

Does it pay for the regime to establish the critical mass for a network of political supporters? The regime may be better off by simply relying on its autonomous stability ($n = 0$) rather than choosing such a costly large network of supporters ($\bar{n}$). The revenue with a critical mass of politically-connected firms amounts to $R(\bar{n}) = \left(\pi + \bar{n} \cdot z^2 \cdot \theta\right) \cdot (N - \bar{n}) \cdot \tau \cdot \theta$. Without any political supporters, the regime generates an expected revenue of $R(n = 0) = \pi \cdot N \cdot \tau \cdot \theta$. The government will be better off without political supporters if $R(0) \geq R(\bar{n})$. Simplifying and inserting $\bar{n}$ yields: $\tau \leq \left(\frac{1}{z^2 \cdot \theta} - N + ½ \right) \cdot \frac{1}{N}$ which is equivalent to (6). Hence, when the exploitative power of the regime is sufficiently low so that a critical mass of politically-connected firms above the optimal number is needed for all values of π, then the government is better off by relying on its autonomous stability. Regimes with a higher exploitative power ($\tau > \tau_0$) find it profitable to create a network of politically-connected firms even if this requires a critical mass of firms $\bar{n}$. Proposition 2 summarizes the findings of this section.

Proposition 2. *The existence of politically-connected firms requires, first, the autonomous stability of the regime to be sufficiently low and, secondly, the extortion of independent firms to be sufficiently high.*

(a) For $0 \leq \tau \leq \tau_0$, *a network of politically-connected firms is never profitable for the regime.*

(b) For $\tau_0 < \tau \leq \tau_1$, *the size of the network depends on the autonomous stability of the regime. The network of politically-connected firms has to reach a critical mass* $\bar{n}$ *for* $0 \leq \pi < \pi_0$. *It has the revenue maximizing size* n^* *for* $\pi_0 \leq \pi < \pi_1$. *Finally, politically-connected firms are not needed at all when the autonomous stability of the regime is sufficiently high (*$\pi > \pi_1$*).*

(c) For $\tau_1 < \tau \leq 1$, *the regime will operate a revenue maximizing network* n^* *of politically-connected firms if* $0 \leq \pi < \pi_0$.

Proposition 2 shows that the number of politically-connected firms decreases in the autonomous stability but it may fail to exist at all when the exploitative power of the regime is too low. From a welfare point of view, all stabilization efforts by firms are clearly wasteful as resources from productive entrepreneurial activities are diverted.

4. Investing in Autonomous Stability

So far, we have taken the regime's autonomous stability as exogenous. This stability is based, e.g., on the loyalty of the police forces and the military strength. However, all factors contributing to the stability of a regime depend to some extent on the resources available to the regime. More resources allow the ruling elite to employ a larger staff in the armed forces or to pay higher wages, thus strengthening loyalty. Therefore, we endogenize the stability of the regime π in this section. The regime does not only decide on the number of politically-connected firms but also on the allocation of revenues. The regime can use the revenues for (utility enhancing) consumption or for stability generating expenditures.

We slightly modify the basic model. In stage 1, the regime decides on the number of politically-connected firms *n* and on the resources *x* devoted to measures strengthening the stability of the regime $\pi(x)$. The government maximizes its (net) revenue

$$R = p(\pi(x), n) \cdot (N - n) \cdot \tau \cdot \theta - x$$

which is disposable for the regime's consumption. We assume that the autonomous stability $\pi(x)$ is an increasing and concave function of the resources x [$\pi'(x) > 0$, $\pi''(x) < 0$]. In stage 2, the politically-connected firms decide on their stabilization efforts. For simplicity, we will focus on interior solutions n^* in the following and neglect the issues of critical mass discussed in the previous section. We simply assume that, in equilibrium, the entrepreneurs and the regime find it profitable to create a network of politically-connected firms.

The Stabilization Strategy of the Regime

As nothing has changed in stage 2, the optimal effort $g^* = z \cdot \theta$ is still the same. Therefore, we can immediately start analyzing the regime's choice. The government maximizes

$$\max_{n,x} \; R = \left(\pi(x) + n \cdot z^2 \cdot \theta\right) \cdot \left(N - n\right) \cdot \tau \cdot \theta - x .$$

The first-order conditions are

$$\frac{\partial R}{\partial n} = \tau \cdot \theta \cdot \left[- \pi(x) + \left(N - 2 \cdot n\right) \cdot z^2 \cdot \theta \right] = 0 \quad . \tag{7}$$

$$\frac{\partial R}{\partial x} = \tau \cdot \theta \cdot \left(N - n\right) \cdot \pi'(x) - 1 = 0 . \tag{8}$$

Note that spending on autonomous stability x and creating a network of political allies n are substitutes for the regime. An increase in the number of politically-connected firms will go along with a reduction in the spending on autonomous stability. Equations (7) and (8) implicitly define the regime's strategy $n^*(\tau, \theta, z, N)$ and $x^*(\tau, \theta, z, N)$. For a maximum, the second-order conditions require

$$- 2 \cdot \left(N - n\right) \cdot z^2 \cdot \theta \cdot \pi''(x) - \pi'(x)^2 > 0 . \tag{9}$$

For the subsequent analysis, we assume that condition (9) is fulfilled. Solving (7) for n and substituting in (8) yields

$$\tau \cdot \theta \cdot ½ \cdot \left(N + \frac{\pi(x^*)}{z^2 \cdot \theta} \right) \cdot \pi'(x^*) - 1 = 0 . \qquad (10)$$

Comparative Statics

We can use equation (10) for exploring the comparative-static properties of the extended model. How does the regime react to an increase in its exploitative power τ? Implicit differentiation of (10) gives

$$\frac{dx^*}{d\tau} = -\frac{\left(N + \frac{\pi(x^*)}{z^2 \cdot \theta} \right) \cdot \pi'(x^*)}{\tau \cdot \left[\left(N + \frac{\pi(x^*)}{z^2 \cdot \theta} \right) \cdot \pi''(x^*) + \frac{\pi'(x^*)^2}{z^2 \cdot \theta} \right]} = -\frac{2 \cdot (N - n^*) \cdot \pi'(x^*)}{\tau \cdot \left[2 \cdot (N - n^*) \cdot \pi''(x^*) + \frac{\pi'(x^*)^2}{z^2 \cdot \theta} \right]} > 0$$

The denominator must be negative as the term in brackets is equivalent to the second-order condition (9). If the power to extract profits from independent firms (τ) increases, the regime will invest more resources for strengthening the autonomous stability (military spending, police forces …). Because autonomous stability and connected firms are substitutes, the regime, in return, shrinks the network of politically-connected firms.

Proposition 3. *An increase in the exploitative power of a regime leads to higher expenditures on autonomous stability ($dx^*/d\tau > 0$) and reduces the number of politically-connected firms ($dn^*/d\tau < 0$).*

In the basic model, the optimal number of politically-connected firms n^* was independent of the regime's exploitative power τ. The power to extract rents only played an indirect role in determining whether a critical mass of politically-connected firms is necessary. The extension of endogenous investment in stability helps to paint a more realistic picture of regimes with politically-connected firms. When a regime has little power to extract rents from independent firms, it has to share rents with politically affiliated firms. This indirect strategy of stabilizing the regime becomes inferior when the regime's exploitative

power rises. The regime gradually replaces stabilization through political allies with autonomous stability.

The other comparative static results can be derived in a similar way. Therefore, we drop the formal analysis and only report the results. If the efficiency of politically-connected firms (z) increases, the regime has an incentive to reduce the expenditures for autonomous stability and increase the number of politically-connected firms. The regime's reaction to increases in rents (θ) is ambiguous. Higher rents foster the regime's incentives for more stabilization efforts. This leads *ceteris paribus* to a larger number of politically-connected firms. However, higher profits also increase the opportunity cost of maintaining political allies. Therefore, the regime has an incentive to substitute politically-connected firms with investment in autonomous stability.

Welfare Analysis

From a welfare point of view, all stabilization efforts – either by the regime or by the affiliated firms – are economically wasteful. In the following, we depart from the first-best view and ask whether the mix of stabilization efforts is at least second-best optimal. Given its survival probability p, does the regime employ too many or too few politically-connected firms? Does the combination of politically-connected firms and spending on autonomous stability minimize social costs?

The social planner maximizes total output minus the cost of stabilization

$$\max_{n,x} \; W = N \cdot \theta - \tfrac{1}{2} \cdot n \cdot z^2 \cdot \theta^2 - x$$

for a given survival probability $p(x^*, n^*) = \pi(x) + n \cdot z^2 \cdot \theta$ where $p(x^*, n^*)$ is the survival probability in equilibrium [cf. equations (7) and (8)]. Substituting for n and differentiating welfare with respect to x yields $\pi'(x^{opt}) = 2/\theta$. The social planner uses spending on autonomous stability as long as the marginal productivity of x exceeds $2/\theta$. All additional

stabilization [$n = \frac{p(x^*, n^*) - \pi(x^{opt})}{z^2 \cdot \theta}$] comes through politically-connected firms as the contribution of politically-connected firms exhibits constant returns to scale.[9]

A comparison of the social planner's solution with the regime's choice of stabilization efforts [see (7) and (8)] provides no clear-cut answer to whether there are too many politically-connected firms. The reason for the ambiguity is that the regime neglects two countervailing externalities in its decision. These externalities become clearly visible when we compare the objective function of the social planner (*W*) and with the regime's objective function (R):

$$W = \quad N \cdot \theta - \quad n \cdot \tfrac{1}{2} \cdot z^2 \cdot \theta^2 - x$$
$$R = p \cdot \tau \cdot (N \cdot \theta - n \cdot \theta \ ) \ - x$$

On the one hand, the regime underestimates the costs of political connections. Whereas the cost of autonomous stability (*x*) has to be paid with probability 1, the cost of political connections only occurs with probability *p*. Furthermore, the regime can only extract a share $\tau<1$ of all rents from independent firms. This relative price effect gives the regime the incentive to an excessive use of politically-connected firms. On the other hand, the regime considers the loss of rents to politically-connected firms as a cost (θ). However, the social cost of a politically-connected firm only amounts to $\tfrac{1}{2} \cdot z^2 \cdot \theta^2$ – the resources wasted on political stabilization. Hence, the regime *ceteris paribus* will overestimate the cost of political connections and it will tend to employ too many politically-connected firms. Whether the network of politically-connected firms is larger or smaller than the second-best solution depends on the net effect of these two externalities.[10]

[9] We assume an interior solution, i.e. $p(x^*, n^*) > \pi(x^{opt})$.

[10] Assuming $\pi(x) = k \cdot \sqrt{x}$, a closed form solution can be obtained. For an interior optimum, the regime will employ an excessive number of politically-connected firms if the production of autonomous stability is sufficiently inefficient (small *k*), if the exploitative power (τ) is low and if number of firms (*N*) is sufficiently large. Note that these results are obtained for a given survival probability; for first best, the social planner would set all stabilization efforts to zero.

5. Elections

So far, we have analysed autocratic regimes which need political support but do not depend on election outcomes. Now, we turn to democratic institutions and show how the model of politically-connected firms can be applied to governments that have to seek re-election. We consider a setting where the incumbent government is uncertain about the size of its electorate that would support the current regime. Politically-connected entrepreneurs help the government mobilizing additional voters and thus increasing the probability of re-election.

Let $p = \pi + z \cdot \sum_{i=1}^{n} g_i$ denote the vote share of the government where $z \cdot \sum_{i=1}^{n} g_i$ are the additional voters (as a share of population) whose support of the government is achieved through the effort g_i of the politically-connected firms. In particular, employees working in the politically-connected firms have a strong incentive to support the incumbent government as it will secure their jobs. The government is uncertain about the size of its electorate. We assume that π is uniformly distributed on the interval $[\underline{\pi}, \overline{\pi}]$. There is an extensive literature making use of uncertain electorates. The assumption is usually justified either by uncertainty about voters' preferences or by policy platforms which are imperfectly observable for voters. For instance, the approach is used to analyse policy convergence with partisan politicians [Alesina and Rosenthal (1995, chapter 2) or special interest group politics in the presence of informed and uninformed voters [Coate (2004), Grossman and Helpman (1996)].

The government will be re-elected if it gains the majority of votes: $\pi + z \cdot \sum_{i=1}^{n} g_i \geq ½$.

The smallest realization of π that stills wins the election for the government is given by $\pi^0 = ½ - z \cdot \sum_{i=1}^{n} g_i$. For a given effort level of the politically-connected firms, the re-election probability amounts to

$$q \equiv \int_{\pi^0}^{\overline{\pi}} \frac{1}{\overline{\pi} - \underline{\pi}} d\pi = \frac{1}{\overline{\pi} - \underline{\pi}} \cdot \left(\overline{\pi} - ½ + z \cdot \sum_{i=1}^{n} g_i \right).$$

As before, we solve the game backwards starting with the decision of politically-connected firms on their effort levels (stage 2). Each firm maximizes $Ey_j = q(g_j) \cdot \theta - ½ \cdot g_j^2$ which yields $g_j^* = \frac{z \cdot \theta}{\overline{\pi} - \underline{\pi}}$. Throughout this section, we assume interior solutions as the analysis of corner solutions yields no additional insights.

In stage 1, the government decides on the number of politically-connected firms *n*. Let $\pi^e \equiv \frac{\underline{\pi} + \overline{\pi}}{2}$ denote the expected vote share and let $\varepsilon \equiv \overline{\pi} - \pi^e = \pi^e - \underline{\pi}$ denote (half of) the range of the distribution. Then, ε can be interpreted as a measure for the government's uncertainty about its electorate. Substituting the privately optimal effort g_j^* and using the previous definitions, we can write the re-election probability as $q(n) = \frac{1}{2 \cdot \varepsilon} \cdot \left(\pi^e + \varepsilon - ½ + \frac{\theta \cdot z^2 \cdot n}{2 \cdot \varepsilon} \right)$.

The government maximizes the expected revenue $R = q(n) \cdot (N - n) \cdot \tau \cdot \theta$. Solving the first-order condition

$$\frac{\partial R}{\partial n} = \tau \cdot \theta \cdot \left[\frac{\partial q}{\partial n} \cdot (N - n) - q \right] = 0 \qquad (11)$$

for *n* yields the optimal size for the network of politically-connected firms

$$n^* = \frac{N}{2} - \frac{\varepsilon}{z^2 \cdot \theta} \cdot \left(\pi^e + \varepsilon - ½ \right). \qquad (12)$$

If the expected size of its electorate grows, the government needs fewer politically-connected firms ($\partial n^* / \partial \pi^e < 0$). If the uncertainty about the electorate grows, the impact on the size of firm network will depend on the magnitude of the uncertainty: $\frac{\partial n^*}{\partial \varepsilon} = -\frac{\pi^e + 2 \cdot \varepsilon - ½}{z^2 \cdot \theta} \gtrless 0 \Leftrightarrow$ $\varepsilon \gtrless ½ \cdot \left(½ - \pi^e \right)$. For $\pi^e < ½$, i.e. when there would be no re-election without the support of

politically-connected firms on average, the network of politically-connected network first grows with increasing uncertainty and then shrinks again.

Proposition 4. *The prevalence of politically-connected firms decreases with the expected vote share. An increase in the re-election uncertainty increases (decreases) the network of politically-connected firms if* $\varepsilon < (>)\ \tfrac{1}{2} \cdot \left(\tfrac{1}{2} - \pi^e\right)$.

To obtain a better understanding of the forces at work behind Proposition 4, we sort out the relevant effects. Suppose for the moment that the effort per firm is fixed at $\bar{g}$. Then the first-order condition (11) reads

$$\bar{g} \cdot (N - n^*) - \left(\pi^e + \varepsilon + \bar{g} \cdot n^* - \tfrac{1}{2}\right) = 0 . \tag{13}$$

Implicit differentiation yields

$$\frac{dn^*}{d\varepsilon} = -\frac{1}{2 \cdot c} .$$

Hence, with fixed efforts of the politically-connected firms, the government would strictly react with a reduction of the network size *n* if the uncertainty increased. However, the firms in the network cut their efforts back when uncertainty increases $\left(\frac{dg}{d\varepsilon} = -\frac{\theta \cdot z^2}{2 \cdot \varepsilon^2} < 0\right)$ because each firm's influence on the total vote share shrinks.

How does the government react to the waning support? Implicit differentiation of (13) leads to

$$\frac{dn^*}{d\bar{g}} = \frac{N - 2 \cdot n^*}{2 \cdot c} .$$

An increase in uncertainty reduces the firms' efforts: Such a decline in *g* forces the government to increase the number of connected firms if the network is sufficiently large ($n^* > N/2$).[11] This countervailing effect explains the ambiguous result of Proposition 4.

[11] Note that $n^* > N/2$ always holds for $\varepsilon < \tfrac{1}{2} \cdot \left(\tfrac{1}{2} - \pi^e\right)$; cf. (12).

Governments in early stages of democratization processes may be tempted to use politically-connected firms to secure their power. Democratization may erode the average vote share (lower π^e) – also because it may become more difficult rigging election outcomes. Furthermore, democratization may create uncertainty (ε) about the election outcome. According to our model, both effects strengthen the government's incentive for extending the network of politically-connected firms.

6. Conclusion

Political connections between firms and autocratic regimes are a pervasive phenomenon. We have argued that the tying of a firm to a regime acts as a credible commitment forcing entrepreneurs to support the government and to exert effort in its stabilization. In return, politically-connected firms get access to profitable markets and are exempted from the regime's extortion. Such a "gift exchange" between government and politically-connected firms can only exist if certain institutional conditions are met. The political network has to be profitable for both the politically-connected firms and the regime. This will only be the case if the autonomous stability of the regime is sufficiently low but, at the same time, the regime is strong in exploiting the independent firms. We have also shown that building up a network of politically-connected firms acts as a substitute for investments in autonomous stability (military spending, police forces …). The indirect strategy of stabilizing a regime via politically-connected firms gradually becomes inferior when a regime's exploitative power rises.

To our knowledge, the paper is the first attempt to formalize the institutional preconditions for networks of politically-connected firms. However, there are still many open questions that should be dealt with in future research. What can be said about the size distribution of politically-connected firms? Is it always the large firms that cooperate with the regime? What type of entrepreneurs become political allies? Do the efficient entrepreneurs

enter the political network or are political ties a substitute for managerial efficiency? Are political connections partly a protection from tough competition so that inefficient firms can survive more easily? We hope to answer some of these questions in our future work.

Acknowledgments

We thank Vesa Kanniainen, Juergen Meckl, Apostolis Philippopoulos, Mattias K. Polborn, Regina Riphahn, Ronnie Schöb, Achim Wambach, Berthold U. Wigger, the Editor-in-Chief Jay Wilson, two anonymous referees, the seminar participants at the CESifo Area Conference on Public Sector Economics and at the FGV-MSU Workshop on Institutions, Policy Performance and Cooperation for helpful comments.

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